An endoluminal graft which is both expandable and supportive is provided in a form suitable for use in a branched body vessel location. The graft expands between a first diameter and a second, larger diameter. The support component is an expandable stent endoprosthesis. A liner is applied to the endoprosthesis in the form of a compliant wall material that is porous and biocompatible in order to allow normal cellular invasion upon implantation, without stenosis, when the expandable and supportive graft is at its second diameter. The supportive endoluminal graft is preferably provided as a plurality of components that are deployed separately at the branching body vessel location, one of which has a longitudinal seam defining leg portions within which the other components fit in a telescoping manner.

30 Claims, 6 Drawing Sheets